PELAGOCEPHALUS MARKI, A NEW SPECIES OF PUFFER FISH (TETRAODONTIDAE) FROM SOUTH AFRICA

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ABSTRACT

A new species of puffer fish (Pisces: Teleostei) is described from three specimens collected on the eastern coast of the Cape Province. This new species is closely related to *Pelagocephalus coheni* Tyler and Paxton, 1979 from Norfolk Island. Both species are small puffers with a peculiar, disc-shaped exposed nasal organ and a parasphenoid bone with paired ventrolateral flanges. The new species differs most notably from *P. coheni* in lacking a lateral line and in the size and distribution of the dermal spines.

On the morning of 17 November 1979, Mark Pote found an unusual little puffer fish alive in a tide pool at Port Alfred on the southeast coast of South Africa. Despite his efforts to keep it alive, the fish died the next day and was then donated to the J. L. B. Smith Institute of Ichthyology. Two additional specimens of this new species (collected at Port Elizabeth in 1971 and 1978) were subsequently discovered among some miscellaneous unidentified fishes in the Institute's Fish Collection.

Superficially, and in its remarkable nasal organ, this new species resembles the small puffer fish *Pelagocephalus coheni* Tyler and Paxton, 1979. Our new species differs from *P. coheni*—and nearly all other tetraodontid fishes—in lacking a lateral line. Additional differences between this new species and other puffers are given below.

METHODS

Standard length, head length and snout length are measured from the symphysis of the upper-jaw teeth. Orbit diameter is the horizontal diameter of the clear window (cornea?) over the eye. Principal caudal rays are defined as those rays in contact with the distal ends of the hypural bones.

Pelagocephalus marki new species

Figure 1

Holotype.—RUSI 10734, adult female, 59 mm SL, collected by Mark Pote in a tide pool at Port Alfred, approximately 400 m east of the Kowie River mouth; 17 November 1979.

Paratypes.—RUSI 10900, sex not distinguishable, 56 mm SL, collected by D. J. Henderson at Seaview, Port Elizabeth; 4 September 1971. RUSI 993, 64 mm SL, adult female, collected by Michel Sixel at Sardinia Bay, ca. 20 km west of Cape Recife (34°04'S, 25°30'E); 10 September 1978; donated by Malcolm Smale.

Description.—(based on holotype) Body depth (uninflated) 3.0 in SL; head length 2.5 in SL. Orbit diameter 4.0, interorbital width 2.6 and snout length 2.2 in head. Dorsal and anal fins with 9 rays, the first unbranched, all others branched. Caudal fin with 9 principal rays (lowermost unbranched and all others branched) and 1 much shorter, procurrent ray above and below. Pectoral fin with 14 rays, two uppermost unbranched, rest branched; uppermost ray about ⅓ length of adjoining ray. Vertebrae 17, 8 abdominal and 9 caudal.

Nasal organs (Fig. 2) a flat disc-shaped shallow depression on each side of

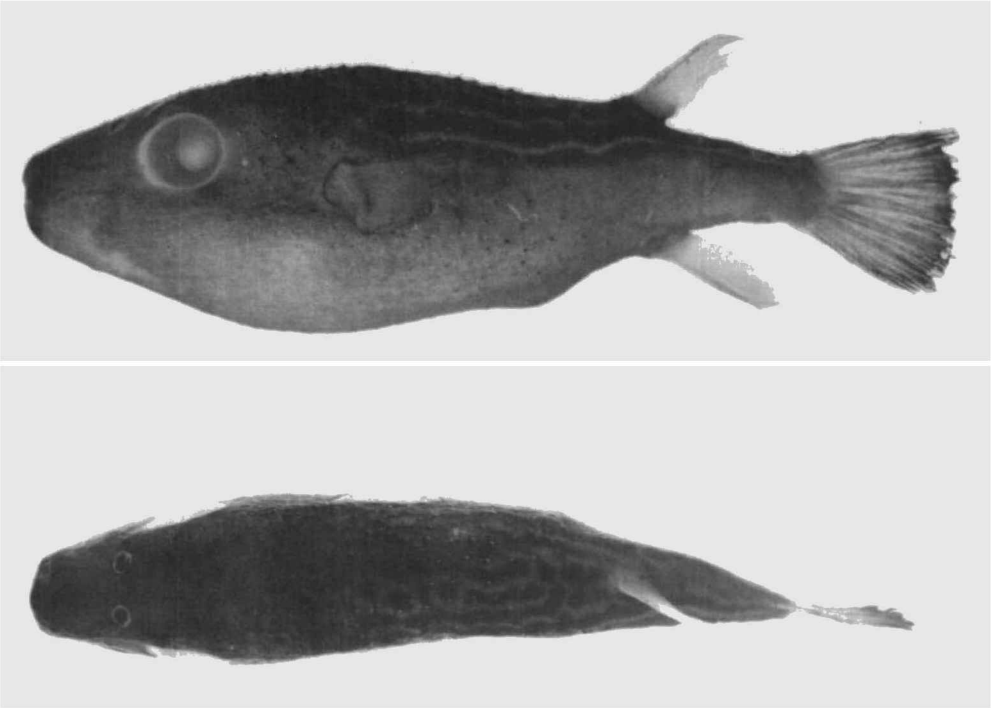

Figure 1. Lateral and dorsal views of *Pelagocephalus marki* new species, holotype, RUSI 10734, adult female, 59 mm SL.

snout. The floor of the depression with irregular corrugated folds of loose skin (rather like the surface of a prune). Rim of nasal organ with a narrow thin (nearly transparent) border of skin projecting towards middle of disc.

No trace of lateral line on head or body; no raised ridge of skin along belly or

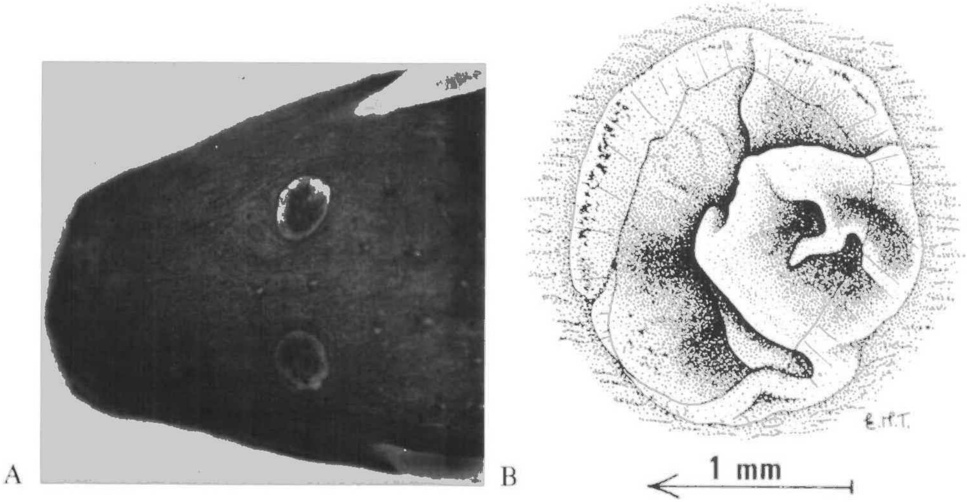

Figure 2. A, Dorsal view of snout and anterior part of interorbital region of *P. marki* holotype showing large disc-shaped nasal organs; B, left nasal organ of *P. marki* holotype (arrow points anteriorly).

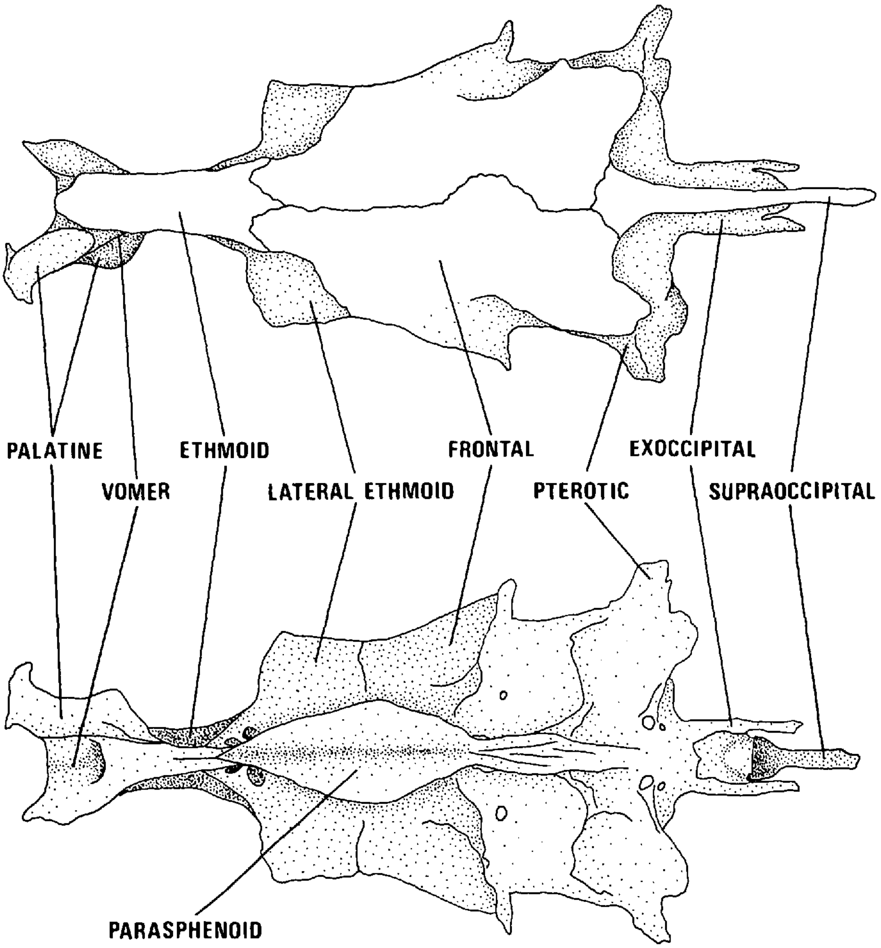

Figure 3. Dorsal view (above) and ventral view (below) of the cranium of *P. marki*, RUSI 10900, 56 mm SL; right palatine bone removed. Camera lucida drawing of cleared and stained preparation.

caudal peduncle. Dermal spines relatively large (compared to most tetraodontids), present all over head and body except for snout and caudal peduncle. Gill openings crescentic, extending from upper end of pectoral base to level of 7 to 10th ray (counting from uppermost ray).

Measurements.—(in millimeters; holotype, followed by paratypes in parentheses) Upper tooth plate symphysis to base of caudal fin 59 (56, 64), to gill opening 23.7 (23.8, 25.8), to eye 10.6 (11.0, 12.1), to dorsal fin origin 44.8 (42.7, 50.0), to anus 40.7 (44.7, 50.0), and to anal fin origin 47.7 (45.8, 51.4). Body depth 20.0 (27.0, 23.2); least depth of caudal peduncle 5.0 (4.8, 6.2); caudal peduncle depth at end of anal fin base 6.8 (6.4, 8.2); anal fin base to ventralmost caudal ray 6.9 (8.2, 7.7). Orbit (diameter of transparent cornea) 6.0 (6.2, 7.0); interorbital width 9.1 (7.4, 9.6); diameter of nasal organ 1.5 (1.5, 2.2); distance between nasal organs 2.3 (2.0, 2.2); distance from mouth to nasal organ 7.2 (7.5, 8.0); distance from nasal organ to eye 2.8 (2.1, 2.7); distance from eye to gill opening 7.0 (6.8, 7.5). Length of dorsal fin 9.9 (9.8, 11.0), anal fin 10.0 (9.4, 11.7), caudal fin 11.2 (12.8,

Table 1. Characters of *Pelagocephalus marki* sp. nov. compared with *P. coheni* (as given by Tyler and Paxton, 1979)

Character	*P. marki*	*P. coheni*
Lateral line	Absent	Present
Gill opening	Not reaching below 10th pectoral fin ray	Reaching level of lower end of pectoral fin base
Dermal spines	Large, covering head and body except snout and caudal peduncle	Small, on belly only
Caudal fin	Upper and lowermost rays much shorter than others	Upper and lowermost rays as long as others
Anal fin origin	Under dorsal fin base	At rear end of dorsal fin base
Body depth (uninflated)	2.7–3.0 in SL	5.2 in SL

14.2) and pectoral fins 8.1 (7.4, 8.6). Length of dorsal fin base 3.5 (3.1, 4.2), anal fin base 3.5 (3.1, 4.2), and pectoral fin base 4.9 (4.5, 5.3). Height of gill opening 3.3 (3.3, 3.9).

Color.—(in alcohol) Head and body dark grey dorsally, becoming paler laterally, with the belly and ventral part of head whitish. Dark dorsal surface of body and caudal peduncle broken up by network of pale vermiculations. Dorsal and lateral surfaces of head and body with small scattered black specks. Edge of nasal organ and orbit white; upper half of mouth opening also with pale border. Caudal fin dusky, darker distally; other fins pale (mostly transparent).

Color in life (from notes of Mark Pote): Dorsal surface pale luminous green, fading slightly into black laterally; ventral surface bright chrome silver.

Remarks.—Except for one more pectoral fin ray (both paratypes have 15 pectoral rays), the paratypes are very similar to the holotype. The body depth of one of the paratypes is much greater than the other two specimens, because it was inflated when it died. The color pattern is essentially the same, except the dorsal ground color is brown, instead of dark grey as in the holotype. This color difference is possibly the result of both paratypes having been dead for some time before they were preserved, as both specimens were found washed up on the beach.

The intestine of the 64 mm paratype contained some rather large teleost bones.

Relationships.—*Pelagocephalus marki* is most closely related to *P. coheni,* a species recently described from Norfolk Island in the southwest Pacific Ocean. Both species have a parasphenoid bone with paired ventrolateral flanges (Fig. 3). According to Tyler and Paxton (1979), this type of parasphenoid is unique among tetraodontid fishes. The nasal organs of these two species are also very similar and unlike any other tetraodontids.

Incidentally, it should be noted that the nasal organs of *P. coheni* are shown (incorrectly) much smaller on the drawing of the holotype (Tyler and Paxton, 1979: Fig. 2) than indicated by their measurements or the photograph of these organs (Tyler and Paxton, 1979: Fig. 3).

Our new species differs from its Pacific relative, as well as most other tetraodontids, in lacking a lateral line. We have diligently searched all three of our type-specimens and can find no trace of a lateral line. We examined the specimens with the aid of an air jet and also while they were completely immersed in alcohol. Other differences between these two species are given in Table 1.

ACKNOWLEDGMENTS

Pelagocephalus marki is named in honor of M. Pote, the collector of the holotype. We are also indebted to D. J. Henderson and M. Smale for providing the two paratypes of this new species. R. E. Stobbs made the photograph (Fig. 1), and E. Tarr did the drawing of the nasal organ (Fig. 2). We thank J. C. Tyler for his constructive criticism of the manuscript.

LITERATURE CITED

Tyler, J.C., and J.R. Paxton. 1979. New genus and species of pufferfish (Tetraodontidae) from Norfolk Island, Southwest Pacific. Bull. Mar. Sci. 29: 202–215.

DATE ACCEPTED: July 31, 1980.

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